

Amendments to the drawings**In the Drawings:**

Proposed amendments to FIG. 1-4 and 7 are provided herewith. Enclosed are 5 sheets of mark-up copies and 5 sheets of clean as-amended copies, wherein FIG. 1-3 have the text “(Prior art)” added, FIG. 4 has the text “(Background art)” added, and FIG. 7 has the reference 20 replaced with the reference 68.

REMARKS

The Examiner is thanked for the comments in the Action. They have helped us considerably in understanding the Action and in drafting this Response thereto.

It is our understanding that claims 1-9 and 11-20 remain pending in this application, wherein claim 10 has herein been canceled. Claims 19-20, the text of the disclosure, and the figures of the disclosure have been amended for reasons specifically remarked upon, below.

No new subject matter is added by these amendments.

Preliminary item:

We respectfully ask entry of the proposed amended versions of FIG. 1-4 enclosed herewith. As filed, FIG. 1-3 inadvertently failed to include the text “(Prior art)” and FIG. 4 inadvertently failed to include the text “(Background art).” These amendments will bring the figures into conformity with the text in paragraphs [0014]-[0017] of the specification.

Item 1 (The objection to the disclosure):

The Action here states, “*The disclosure is objected to because of the following informalities: “detector 36” (p. 6, line 5) should read — detector 16 --.*” We presume that the Examiner meant paragraph [0027], since this application was filed using the Office’s Electronic Filing System (EFS) which automatically changes line formatting and applies paragraph referencing. If so, this objection is well founded and corrective amendment is made herein.

Item 2 (The objections to the drawings, 1 of 2):

The Action here states:

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims.

Therefore, the gimbal mounts and goniometers (of claim 3); a stage that has two pieces that share the same scale (of claim 4), a system that includes multiple stages and thus multiple displays and sensors (as in claim 5) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Respectfully, this objection is well founded in part and error in part.

Turning to claim 3, it recites that “*said stage [of claim 1] is a member of the set consisting of rotary stages, gimbal mounts, and goniometers.*” While we urge that one of

ordinary skill in the art would readily appreciate that the inventive stage in claim 1 could be integrated into a gimbal mount, we agree that the figures do not literally show this application of the actual invention, and we have herein amended claim 3 to remove recitation of a gimbal mount. With respect to goniometers, however, we disagree. A goniometer is a species of rotary stage used for measuring angles. FIG. 6-7 show stages labeled “Rotary stage” but that could equally be used for goniometric measurement by straightforward programming of the display.

Turning now to claim 4, it recites “*a plurality of said stages and at least two said stages include a same said first piece and share a same said digital scale.*” FIG. 2 (Prior art) clearly shows multiple stages sharing a mount, thus the mechanical aspects here would be understood by one of ordinary skill in the art. FIG. 5a-b, 6 and 7 show a digital scale, thus it would be understood by one of ordinary skill in the art what a “*same said digital scale*” is. And we further note that 37 CFR 1.83(a) does not require that drawings odiously show every possible straightforward variation feature of an invention, rather this states that “*applicant ... is required to furnish a drawing ... where necessary for the understanding of the subject matter sought to be patented.*” Respectfully, we urge that Applicant has shown what is necessary for one of ordinary skill in the art to understand claim 4.

And turning to claim 5, it recites “*a plurality of said stages wherein respective said first pieces are collectively movable with respect to respective said second pieces along a single axis or multiple axes.*” Here again urge that the just stated rationale should apply, i.e., that one of ordinary skill in the art is shown what they would need to understand that claimed subject matter.

Item 3 (The objections to the drawings, 2 of 2):

The Action here states, “*The drawings are objected to ... because they do not include the following reference sign(s) mentioned in the description: “68”*” This objection is well founded and corrective amendment is made herein.

Item 4 (The §112, ¶2 rejection of claims 4-6):

Claims 4-6 are rejected as indefinite. Respectfully we urge that this is error, but in view of the apparent confusion we have amended claims 4-6 to clarify things.

The Action here states:

As to claim 4, what is this claim referring to in the written specification and drawings? Does “same said first piece” (italics added) mean that there is a minimum of one first piece in this claim, or does it mean that there is a minimum of two identical (or similar) first pieces? If the latter, how can the two different pieces (with individual scales) share the same scale? To what extent are the “plurality of stages” (line 2) identical (if at all) to the “stage” (of claim 1)?

What has been missed here, however, is the overall context and the tension between common spoken English and the need for antecedent basis in claims. Claim 4 (now) recites “a plurality of said stages and at least two said stages include a same said first piece” (underlining added). In common spoken English one would simply say that two of the stages include the same first piece. We previously (in claim 1) introduced “a first piece” so it is our understanding under the antecedent basis rules that use of the phrase “said first piece” is required here in claim 4. Also, here we have multiple stages (each having a respective said first piece) and we need to introduce “a same said first piece,” which is one first piece that is common (the same) to two stages. By way of example, FIG. 2 shows three stages all sharing one first piece (the tubular appearing mount).

The Action here next states:

As to claim 5, does “plurality of stages” mean that each of the stages other than (or even some portion of) that of claim 1 include all the limitations of lines 5-last of claim 1? What is this claim referring to in the written specification and drawings?

As noted above, we have amended claims 4-6. This amendment emphasizes that each of the plurality of stages in these claims is an instance of the stage recited in claim 1. With respect to the support for claim 5 in the text and drawings, we note again that the use of multiple stages sharing common physical elements is known (see e.g., FIG. 2 (Prior art)). FIG. 5a-b show a linear stage in accord with the present invention. The novel features of this linear stage can be applied in a multi-stage embodiment, such as that in FIG. 2 (although conventional adjustable stops 26, such as those shown in FIG. 5b, would probably be omitted from such an embodiment). FIG. 5a-b are discussed in paragraphs [0025]-[0027] of the specification.

Item 5 (The objection or rejection of claim 10):

The Action here states, “Claim 10 is a duplicate of claim 9. Is this intended?” No, this was unintentional. We thank the Examiner for observing this. Applicant has herein canceled claim 10 as redundant.

Item 6 (The § 102(b) rejection):

Claims 1, 2, 12, 14, 15, and 18-20 are rejected as being anticipated by Falk.

The Action here states “*Falk et al teach a system including: stage having first 100 and second 16 pieces;*” We submit that one of ordinary skill in the machine tools arts would know that a “stage” is not a fishing rod, and that one of ordinary skill in the sporting goods arts would appreciate that “stage” is not a term used in those arts. Nonetheless, in a responsive spirit we have herein amended the independent claims to explicitly recite that the stage is a machine tool stage. No new subject matter is added by these amendments, since support for the present application being directed to the machine tool arts is located throughout the application, e.g., paragraph [0003]-[0005], starting with “*In many manufacturing and laboratory processes a very high number of stages are still measured by mechanical micrometer.*”; and FIG. 1-3, which clearly show prior art machine tool stages.

Item 7 (The § 103(a) rejections, part 1 of 7):

Claims 4-6 are rejected as being unpatentable (obvious) over Falk. Respectfully this is error. We submit that these dependant claims should now be allowable for at least the same reasons as parent claim 1, discussed above.

Item 8 (The § 103(a) rejections, part 2 of 7):

Claim 13 is rejected as being unpatentable (obvious) over Falk in view of Ozawa or Bicking. We submit that that this dependant claim should now also be allowable for at least the same reasons as parent claim 1, discussed above. While the rejection here is predicated on Falk in combination with Ozawa or Bicking, no argument has been made, nor can one be made, that the teachings of Ozawa or Bicking somehow remedy the deficiency in the teachings of Faulk that this rejection relies on.

Item 9 (The § 103(a) rejections, part 3 of 7):

Claim 17 is rejected as being unpatentable (obvious) over Falk in view of Myers. We submit that this dependant claim should now be also allowable for at least the same reasons as parent claim 1, discussed above. While the rejection here is predicated on Falk in combination

with Myers, no argument has been made, nor can one be made, that the teachings of Myers somehow remedy the deficiency in the teachings of Faulk that this rejection relies on.

Item 10 (The § 103(a) rejections, part 4 of 7):

Claims 3 and 11 are rejected as being unpatentable (obvious) over Falk in view of Helmrichs. We submit that these dependant claims should now be also allowable for at least the same reasons as parent claim 1, discussed above. While the rejection here is predicated on Falk in combination with Helmrichs, no argument has been made, nor can one be made, that the teachings of Helmrichs somehow remedy the deficiency in the teachings of Faulk that this rejection relies on.

Item 11 (The § 103(a) rejections, part 5 of 7):

Claims 9 and 10 are rejected as being unpatentable (obvious) over Falk in view of Helmrichs, Schwabe and Nelle. We submit that these dependant claims should now also be allowable for at least the same reasons as parent claim 1, discussed above. While the rejection here is predicated on Falk in combination with Helmrichs, Schwabe and Nelle, no argument has been made, nor can one be made, that the teachings of Helmrichs, Schwabe and Nelle somehow remedy the deficiency in the teachings of Faulk that this rejection relies on.

Item 12 (The § 103(a) rejections, part 6 of 7):

Claims 7 and 8 are rejected as being unpatentable (obvious) over Sasaki in view of Nelle. Respectfully this is error.

The Action here states “*Sasaki et al teach (Figure 3A) a system employing a stage having first (left hand element) and second (right-hand element) pieces, the first having a scale and the second having display and sensor.*” However, Sasaki does not teach a stage. One of ordinary skill in the relevant arts would perceive its left and right hand elements to merely be elements of a hand tool, one such as might be used to make measurements of a stage.

Sasaki teaches how to manufacture a scale for use in a hand tool, using a hand-held caliper as its sole example, and Nelle teaches a system for attaching a scale to an apparatus, e.g., a machine bed or carriage. We urge that Sasaki and Nelle cannot be properly combined to form a prima facie case for rejection under § 103. The criteria for such includes that there be suggestion

or motivation to combine the references, that there be a reasonable expectation of success, and that the combination teach or reasonably suggest all of the claim limitations. The suggestion or motivation must appear in the references themselves, and that has not been shown and cannot be done here. Sasaki and Nelle also teach irreconcilably different ways to install a scale. Sasaki places gratings 12 onto a substrate 11, within an coating layer 40, with all of this below an adhesive layer 20 and a scale cover 30 (see e.g, FIG. 1 col. 2, ln. 34-56). In contrast, Nelle teaches “*wherein an adhesive layer is provided between [a] scale component and the mounting surface*” (abstract; see also FIG. 2, 4, and 9; col. 2, ln. 64-67).

We further submit that the amendment made herein to independent claim 1, from which claims 7-8 depend, further distinguishes over Sasaki. Those of ordinary skill in the relevant arts will readily appreciate the differences between a hand tool, such as the electronic caliper of Sasaki, the bed or carriage of a machine such as the that of Nelle, and stages and slides (e.g., those depicted in FIG. 1-3 of the present application).

More generally, Sasaki and Nelle provide excellent examples of the need for the presently claimed invention. Nelle teaches a system for attaching a scale to an apparatus, e.g., a machine bed or carriage and Sasaki teaches a hand tool. A major problem the present invention solves is that the stages in many machines, where measurement is critically necessary on a frequent or ongoing basis, do not have integrated means to facilitate that measurement. Sasaki merely teaches how to make a better hand-tool, such as a mechanic or machinist might conventionally use to set up the stages in a milling machine or a semiconductor manufacturing XY table, for instance. Nelle is an example of one prior art scheme to affix a scale to a machine bed or carriage, especially long ones where scale alignment is problematical, so that measurement can be made with other (unspecified) instruments. Neither Sasaki and Nelle appreciates or fills the need for integrating the complete measuring capability into the very stage or stages of a machine tool.

Item 13 (The § 103(a) rejections, part 7 of 7):

Claim 16 is rejected as being unpatentable (obvious) over Sasaki in view of Bezingé. Respectfully this is error.

The Action here again states “*Sasaki et al teach (Figure 3A) a system employing a stage having first (left hand element) and second (right-hand element) pieces, the first having a scale*

and the second having display and sensor.” But again, Sasaki does not teach a stage. One of ordinary skill in the relevant arts would take its left and right hand elements merely to be elements of a hand tool, one such as might be used to make measurements of a stage. And here Bezing is of the same species as Sasaki, i.e., it merely teaches a hand tool such as might traditionally be used to make measurements of a stage.

We here again also submit that the amendment herein to independent claim 1, from which claim 16 depends, further distinguishes over Sasaki and also over Bezing. Those of ordinary skill in the relevant arts will readily appreciate the differences between a hand tool and stages and slides (e.g., those depicted in FIG. 1-3 of the present application).

CONCLUSION

Applicant has endeavored to put this case into complete condition for allowance. It is thought that the objections to the drawings and the §112 rejections have been corrected by amendment or completely rebutted, that the §102 rejections are also addressed by amendment or else shown to be unfounded on the prior art reference cited, and that the §103 rejections have also been addressed by amendment or have been completely rebutted. Applicant therefore asks that all objections and rejections now be withdrawn and that allowance of all claims presently in the case be granted.

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Respectfully Submitted,



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Mark-up copy

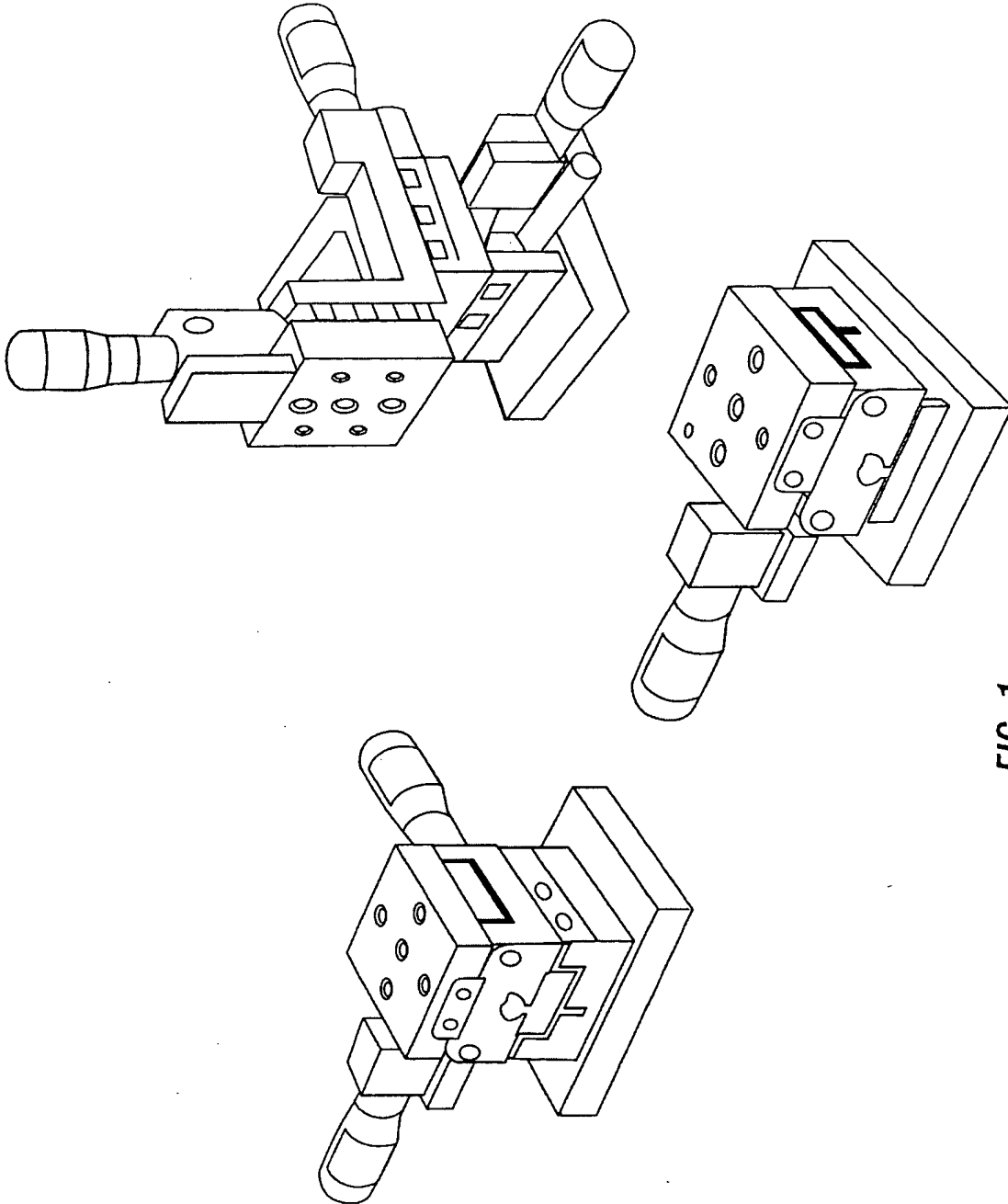


FIG. 1
(Prior art)

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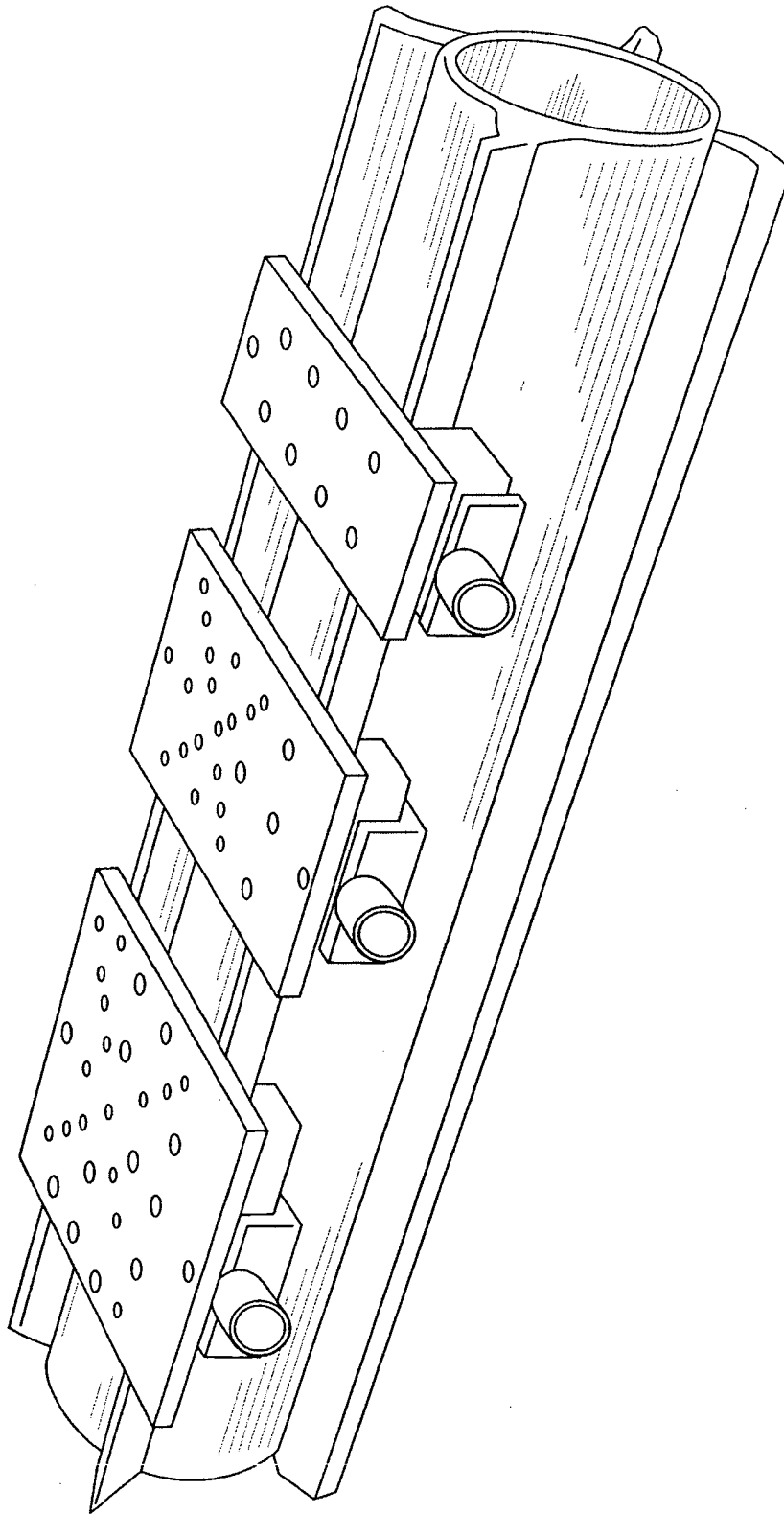


FIG. 2

(Prior art)

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Mock-up copy

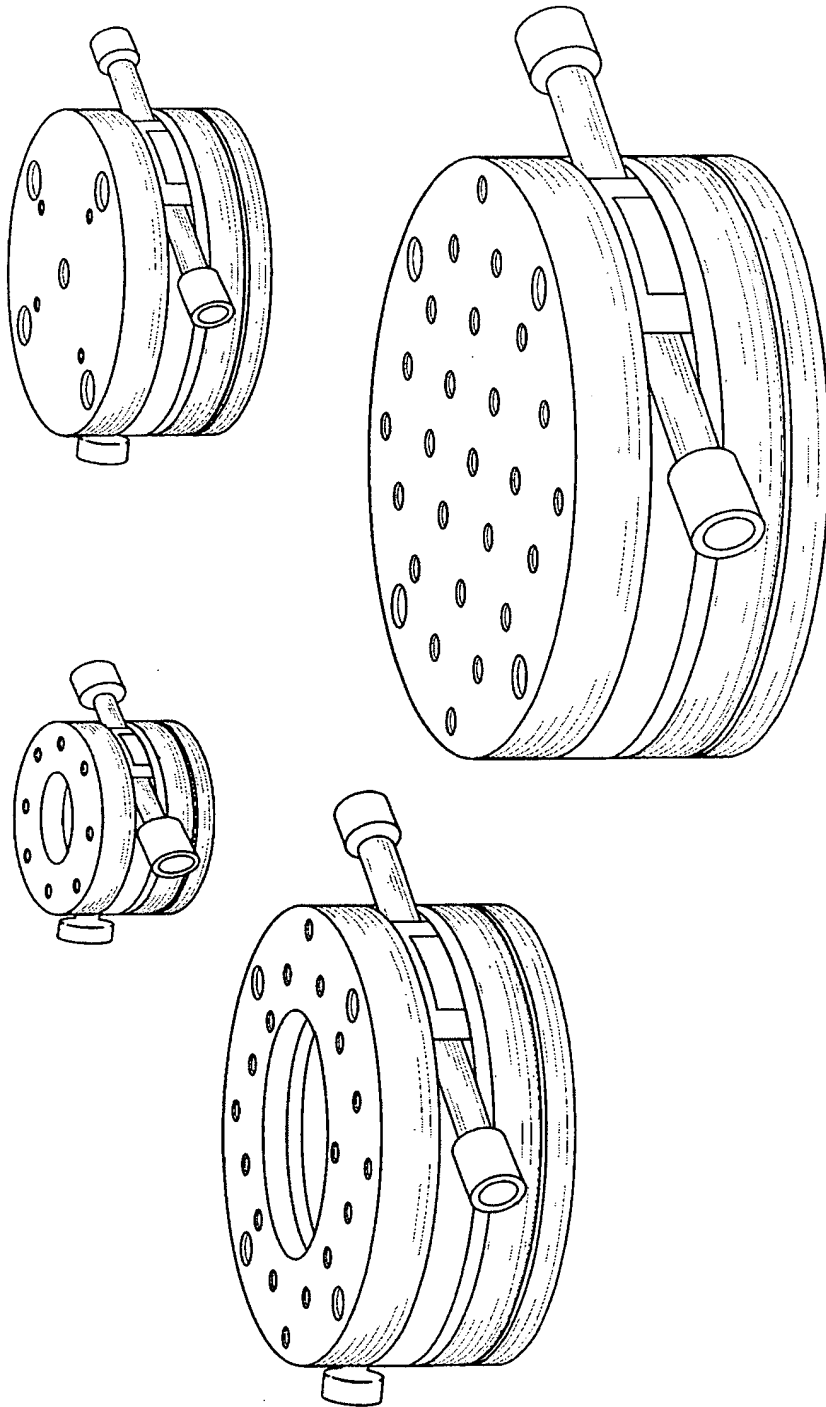


FIG. 3

(Prior art)

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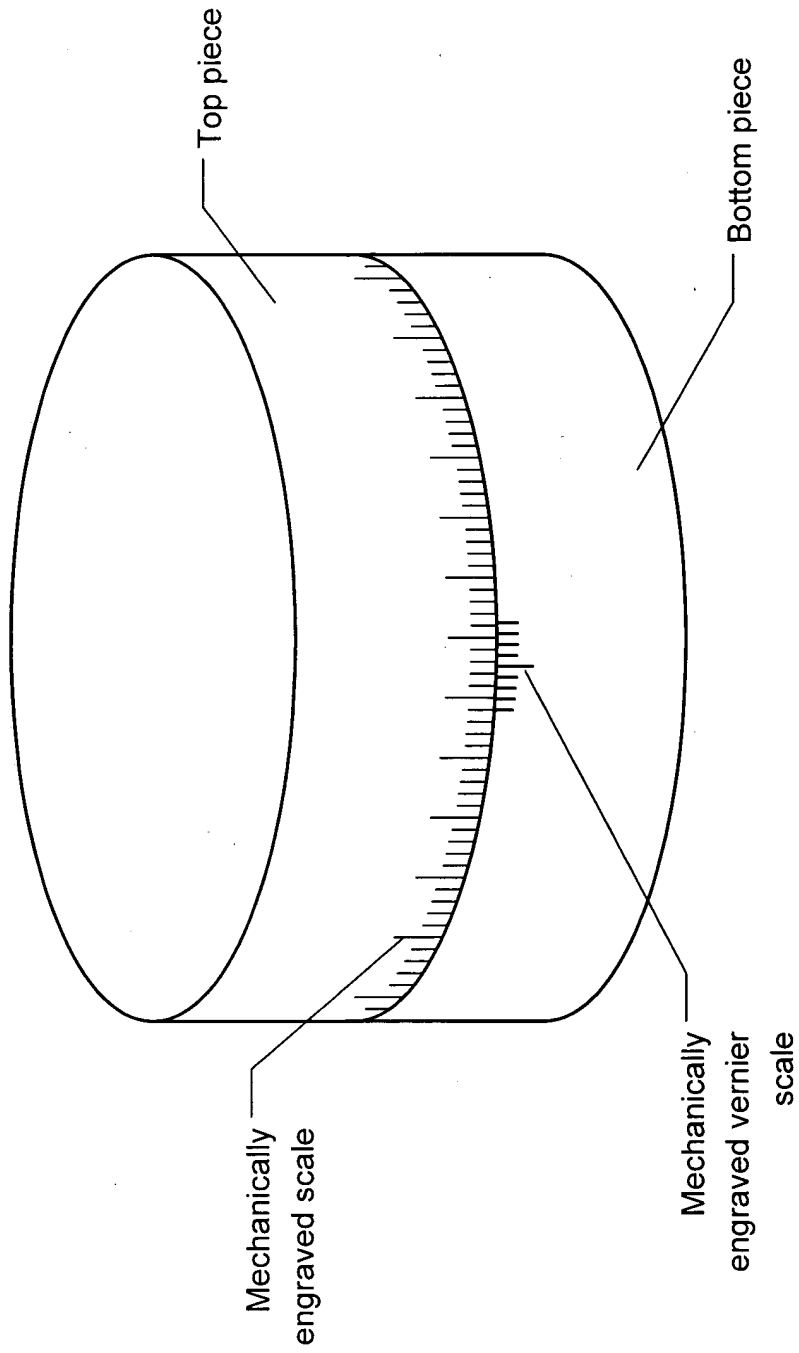


FIG. 4

Rotary stage with mechanically engraved scale
(Background art)

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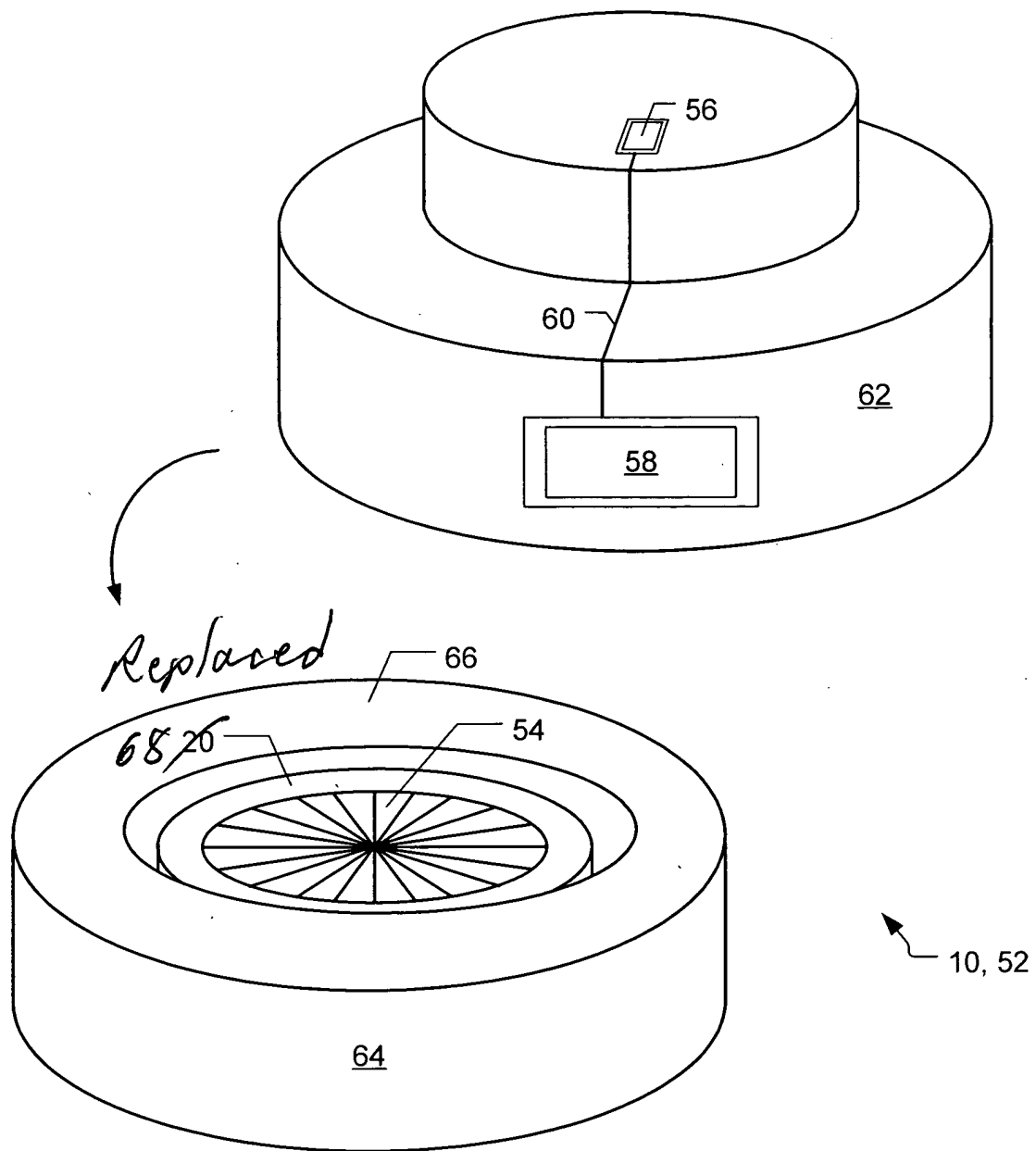


FIG. 7
Rotary stage equipped with digital scale disk